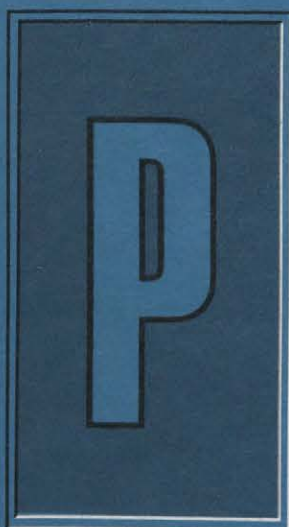


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**1977-1978
ANNUAL
REPORT**

**PRAIRIE
FARM
REHABILITATION
ADMINISTRATION**



**Government
of Canada**

**Gouvernement
du Canada**

**Regional
Economic
Expansion**

**Expansion
Économique
Régionale**

Canada. Prairie Farm Rehabilitation Administration.

**1977-1978
ANNUAL
REPORT**

**PRAIRIE
FARM
REHABILITATION
ADMINISTRATION**



P F R A

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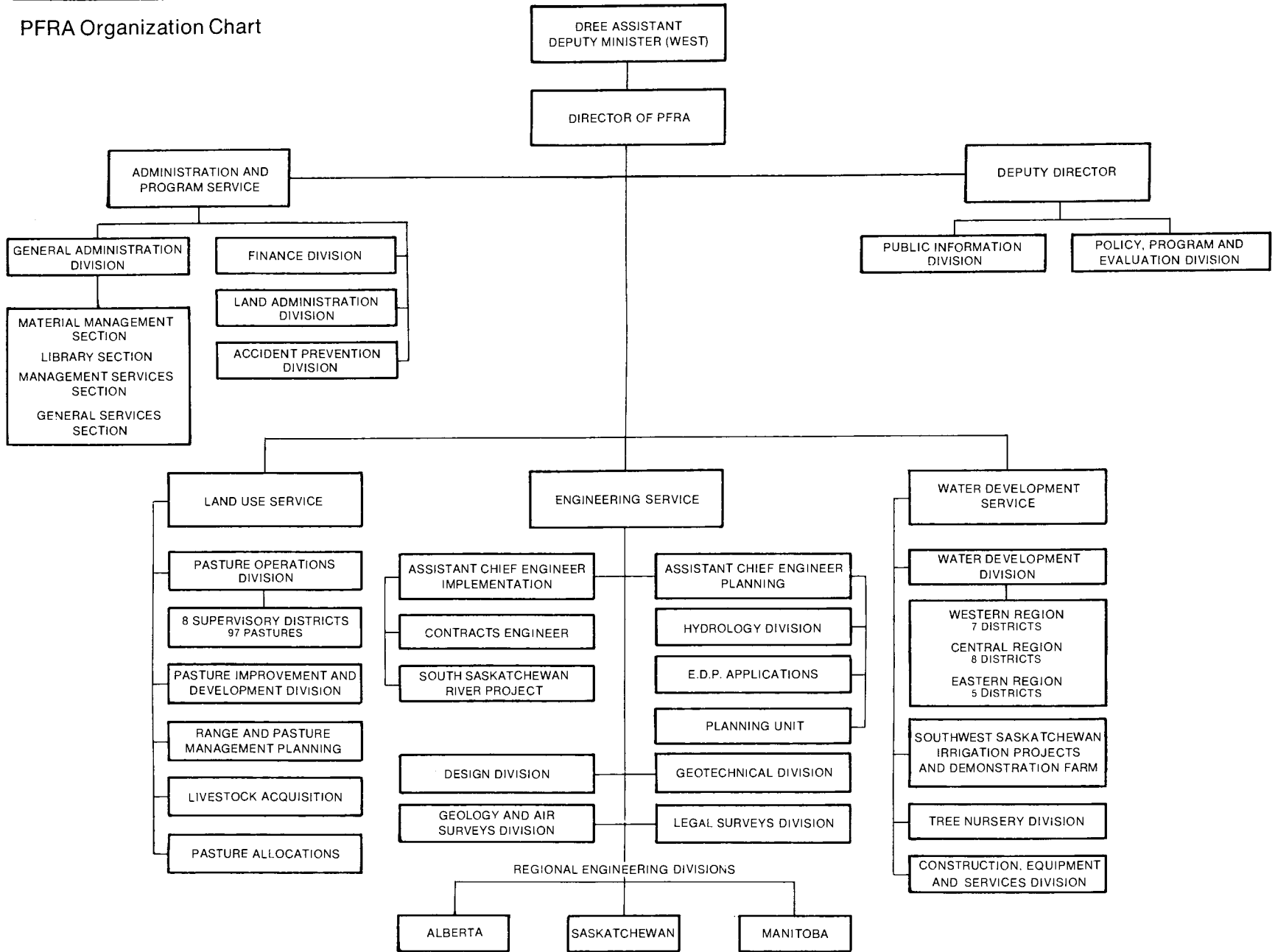
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PFRA Organization Chart



INTRODUCTION

The greatest factor which influenced Prairie Farm Rehabilitation Administration activities in the 1977-78 fiscal year was unquestionably the negligible snowfall of the preceding winter. The extremely low level of resulting runoff on the recurrently thirsty Canadian prairies became critical.

Spring runoff in 1977 was inadequate to replenish supplies for projects ranging in size from small on-farm dugouts to the large reservoirs on which major irrigation systems rely. River levels fell, small waterways dried up and water tables dropped, causing many wells to fail.

As spring winds converted topsoil to small dust clouds, agricultural experts expressed fears that the prairie provinces were facing a period as critical as the drought years of the so-called Dirty Thirties, which resulted in the passing by Parliament of the Prairie Farm Rehabilitation Act.

Fears were prevalent that moisture levels might be insufficient to germinate seed in much of the prairies, which comprise 70 per cent of Canada's improved farmland. The hazard was overcome only by a fortuitous and abnormally heavy rainfall of 146 millimetres (5.75 inches) in May, which mitigated, but did not eliminate the problem.

The effects of moisture deficiency are recorded throughout this publication. They ranged from a reduction in pasture carrying-capacity and shortened grazing season, to the response of the federal government to the threat of drought. Government action included an increase in the technical and financial assistance normally provided through existing PFRA water development programs, and the provision of additional funds for new combative measures.

PFRA was uniquely able to render immediate aid to drought-threatened areas and was successful in administering relief programs in cooperation with provincial governments and other federal agencies. Valuable information obtained during the course of these activities led to the conclusion that the consequences of severe drought, which have occurred at random throughout the region, are not

understood in terms of our present-day society, with its increasing water consumption and diversifying economic base.

H. M. Hill
Director

Highlights of the Year

In addition to the extraordinary activities involved in providing immediate water development assistance to communities and farmers affected by drought, a number of other activities were significant during 1977-78.

- The Policy, Program and Evaluation Division was established late in the fiscal year. (See organization chart, page iv.) The division, which is under the supervision of the Deputy Director, will evaluate PFRA's long-standing programs and determine the socio-economic effects of large-scale or long-term drought in the prairie provinces.
- A five-year agreement was reached which will allow PFRA to use 90 000 acres of the Department of National Defence (DND) land at Suffield, Alberta, for a community pasture.
- The largest engineering project in progress during the year was the replacement of the aqueduct at Brooks, Alberta. This 3.38 kilometre (2.1 mile) waterway, being built under the terms of the Canada-Alberta Irrigation Rehabilitation Agreement at an estimated cost of \$8.1 million, is now in the final phases of construction. It is scheduled to go into service in the spring of 1979.
- The PFRA Tree Nursery at Indian Head, Saskatchewan, celebrated its 75th anniversary and shipped its 400-millionth tree for shelter-belt use.
- PFRA expenditures during 1977-78 totalled \$35 326 755. (See Appendix I for details.)
- Because of the seasonal nature of PFRA activities, the number of employees varied from 700 in winter to 1 100 during peak summer periods.

LAND USE PROGRAM

This program evolved from measures taken after 1937 to stabilize and rehabilitate lands which were submarginal for cereal production. At present, the primary activities of the program are the operation and administration of PFRA community pastures. (See Figure 1 for the geographic locations of community pastures managed by PFRA.)

Pasture management focuses on five elements: conserving the land resources, reducing the impact of drought, stabilizing western beef breeding herds, improving the quality of beef cattle, and providing supplemental grazing for farmers. Grazing allowances are allocated to benefit smaller producers and are scaled in proportion to each individual's owned, leased or rented land resource.

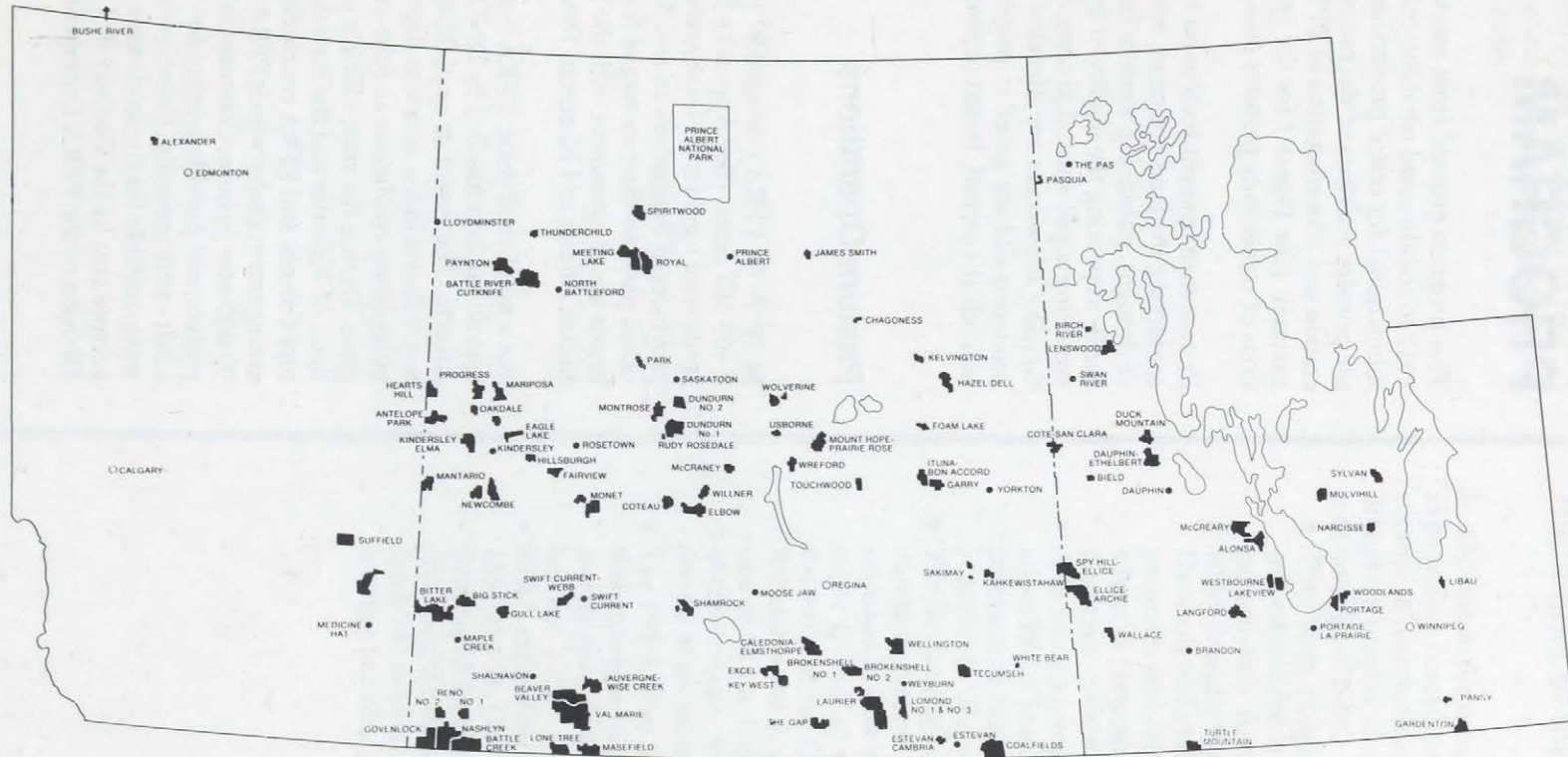
Pasture Operations

In 1977-78, PFRA managed 97 pastures on 2 405 381 acres. (See Appendix II.) In general, lands were used under lease agreements with the provinces of Saskatchewan and Manitoba; additional pastures were managed for several Indian bands under agreement with the Department of Indian Affairs and Northern Development.

For a number of years, PFRA has operated a pasture on lands controlled by DND at Suffield, Alberta. The extent of availability of this pasture to producers in the area was determined yearly by moisture conditions and the availability of grass. During the year, officials of DND, Department of Fisheries and the Environment, Agriculture Canada and PFRA concluded a five-year arrangement under which PFRA will manage a 90 000-acre pasture. Commencing in 1978, the pasture will provide grazing for 5 000 head of adult cattle annually. Investigations for groundwater suitable for livestock were conducted in the pasture area by the Geology and Air Surveys Division of the PFRA Engineering Service.

Figure 1

PFRA Community Pastures

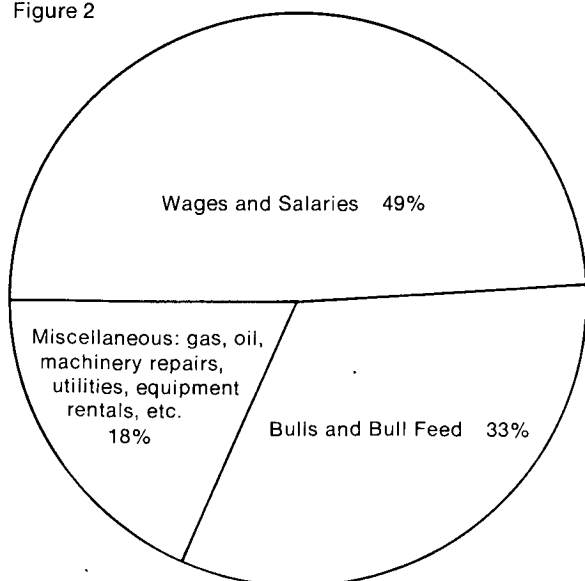


The Pasture Operations Division also made similar studies on 10 community pastures in a 9 583-square-kilometre (3 700-square-mile) area of southern Saskatchewan, and on 10 other community pastures which had stock-watering problems resulting from poor runoff and lowered water tables.

Because of abnormally low precipitation in late 1976 and early 1977, the 1977 grazing season started with the prospect of severe grass and water shortages. This caused general concern and dislocation in the cattle industry. However, PFRA's well developed stock-watering facilities and its practice of conservative grass use permitted a near-normal level of cattle grazing on its community pastures. Grazing was reduced by only 4 per cent: 152 582 adult cattle were pastured, compared to the estimated normal carrying-capacity of 159 325. This 4 per cent reduction compares favourably with the average prairie-wide reduction of 9 per cent.

Breeding fees and grazing fees for cattle and calves were raised in 1977 to cover increased operating costs. These increases were necessary to cover wages and the acquisition and care of breeding bulls. (See Figure 2.)

Figure 2



Direct Costs for Pasture Operations 1977-78

Does not include overhead, vehicles, farm machinery, supervision or indirect costs incurred by PFRA.

Although wage rates have escalated, efficiency in manpower utilization has remained stable over the last several years. Approximately 1 300 head of cattle were pastured per man-year of labour.

The 1977 rate schedule for grazing and breeding was as follows:

Cattle	head/day	\$0.12 (includes 1¢ municipal levy)
Calves	head/season	\$5.50
Horses	head/day	\$0.15 (includes 1¢ municipal levy)
Colts	head/season	\$6.50 (of current year, born before August 1, with dam)
Ewes	head/day	\$0.02 (includes 0.3¢ municipal levy)
Lambs		No charge
Breeding Fee		\$13.00 for each cow placed in breeding field

Pasture Improvement and Development

The Land Use Service plans and implements a large-scale pasture improvement program involving soil and water conservation, construction, and various forms of land development designed to improve and increase forage in community pastures.

Land improvement activities in 1977-78 included a variety of land-clearing processes on 5 000 acres, breaking 4 800 acres, seeding 26 000 acres and spraying 32 500 acres for brush control. Clearing, breaking and seeding declined from 1976, reflecting a decrease in the Pasture Improvement and Development Division's 1977 capital budget.

Water development activities were substantially greater than in the previous year as a direct result of the drought and increased demand for watering facilities for livestock. Included in the year's activities were: excavation of 112 dugouts, enlargement of 97 dugouts, development of

32 wells, reconstruction of existing dams, installation of 170 water troughs and placement of a variety of irrigation structures. The Geotechnical Division of the PFRA Engineering Service undertook groundwater exploration and well construction at nine community pastures; investigations at four of the pastures were major. The Construction, Equipment and Services Division of the PFRA Water Development Service pumped 235 million litres (62 million gallons) of water into dry dugouts on pastures, graded 813 kilometres (508 miles) of access roads on 20 pastures, and painted 16 pasture headquarters buildings.

Other construction involved the building of 107 kilometres (67 miles) and rebuilding of 147 kilometres (92 miles) of fence, bringing to 10 665 kilometres (6 666 miles) the length of fencing which now encloses and divides PFRA pastures. Nine new buildings were constructed and 29 structures renovated. Houses no longer required for the South Saskatchewan River Project were moved to 14 pastures.

Construction of two new pastures in Manitoba, Bield and Libau, was completed during the year.

Three feature articles, illustrated with recent and historic photographs and covering all aspects of community pasture operations, were requested and published by the *Rural Councillor*, a monthly magazine published in Saskatchewan.

WATER DEVELOPMENT PROGRAM

Due to the lack of spring runoff in 1977, on-farm water supplies suffered severely in many areas and large numbers of community supplies were seriously depleted. In direct response, PFRA initiated a number of emergency programs. These were in effect from April 1, 1977 to March 31, 1978. Some activities and expenditures will, however, continue into 1978-79 for projects approved before March 31, 1978.

The number of farm projects increased by approximately 23 per cent over that of 1976-77; 8 987 projects were assisted during the year under review. About 18 per cent of these were in Manitoba, 37 per cent in Saskatchewan and 45 per cent in Alberta. Of all farm projects assisted under the program, the largest increase over the previous year was that of farm dugouts, which increased by 58 per cent.

Nine small community water storage projects were authorized for construction; seven were completed and investigations were carried out on an additional 18 proposals.

News releases issued to print and broadcast media on all aspects of federal drought-relief programs were well received.

Supplemental On-Farm Grant Program

Under the one-year drought-relief emergency program, the restriction of one grant per farmer for dugouts, wells, stockwatering dams and irrigation projects was removed. Under the terms of the program, the maximum grants for dugouts, stockwatering dams and irrigation projects remained at \$550, \$550 and \$600 respectively, but the maximum grant for wells was raised from \$550 to \$1 500. A total of \$1.5 million was allocated for this program. A comparison of the 1977-78 supplemental program to the 1976-77 normal program is shown in Table 1.

Deep Community Wells Agreements

In 1977 PFRA signed agreements with the prairie provinces to share the costs of deep wells for community water supplies. Under the terms of the agreements the federal government, through PFRA, agreed to pay half the cost of deep wells and pipelines from deep wells, up to a maximum of \$30 000 per project. A total of \$1.2 million was allocated for this purpose. Provision was made to allow payment of assistance up to March 31, 1979 for projects approved before March 31, 1978. Table 2 shows details of projects and expenditures made under this program in the fiscal year.

AMENDMENT TO DEEP COMMUNITY WELLS AGREEMENTS

The Deep Community Wells Agreements were amended to allow for a federal contribution of half the cost of overland pumping to fill dugouts and community reservoirs. The funds approved for this program amounted to \$1 million. Details of projects and expenditures under this program are given in Table 3.

In Manitoba 205 farm and community dugouts were filled; all work was performed by the province. In Saskatchewan, the Construction, Equipment and Services Division of the PFRA Water Development Service, at the request of Saskatchewan Agriculture, pumped a supply of 11.4 billion litres (25 million gallons) of water to fill dugouts for 60 farmers. Saskatchewan Regional Engineering Division was represented on the committee which administered the Deep Community Wells program. A total of 39 cases of emergency water transport and the pumping for 1 311 farm dugouts were approved. In Alberta, water was pumped overland to 13 small communities and to 800 individual farm dugouts. This work was supervised in the field by provincial government personnel, and administered by a joint federal-provincial implementation committee.

Approximately \$865 000 will be required in fiscal year 1978-79 to complete programs under this amendment.

Technical Services to Other Agencies

Water Development Division provided technical services to other agencies in 492 instances. These included services to provincial water licensing agencies, the Saskatchewan Family Farm Improvement Branch, the Saskatchewan Conservation and Land Improvement Branch, the federal Department of Indian Affairs and Northern Development, and other federal, provincial and municipal agencies.

Figure 3 shows the geographic locations of the regional offices of the Water Development Division.

Appendix III lists the services and financial assistance provided by the division. Appendix IV shows projects and financial assistance.

Table 1
Comparison of Supplemental On-Farm Grant Program to Normal Program

	1976-77 Normal Program		1977-78 Supplemental Program	
	Number of Projects	Amount of Grants	Number of Projects	Amount of Grants
Dugouts	1 139	\$ 388 346	1 899	\$ 618 888
Stockwatering Dams	92	33 125	113	41 894
Irrigation	83	46 770	179	100 110
Wells	4 968	2 045 263	6 796	3 142 692
Total	6 282	\$2 513 504	8 987	\$3 903 584

Table 2
Deep Community Wells Agreements
Approved Projects and Costs by Province

	Number of Wells	Number of Pipelines	Federal Share of Costs to March 31, 1978
Manitoba	61	6	\$105 000
Saskatchewan	161	52	326 000
Alberta	41	0	69 000
Totals	263	58	\$500 000

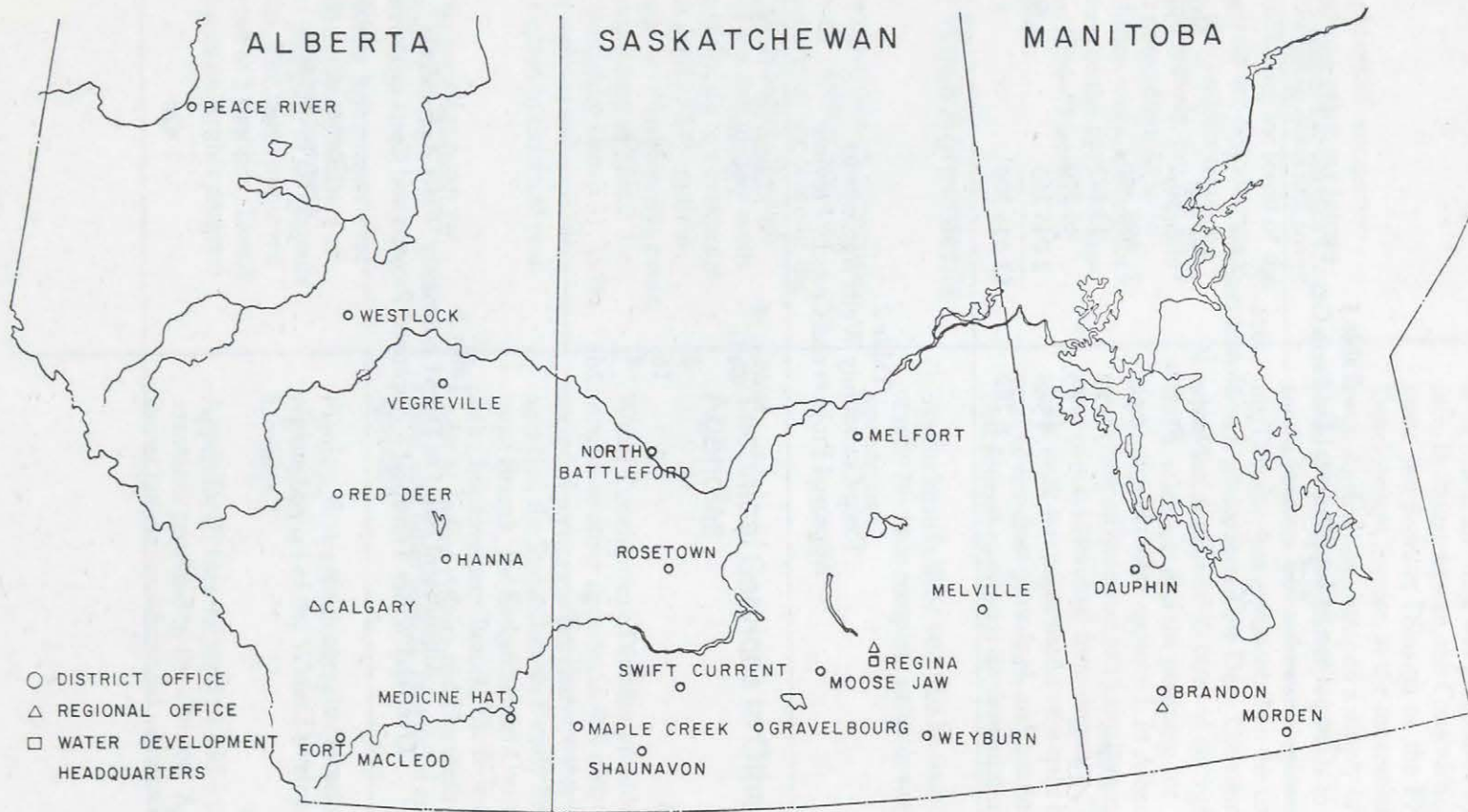
Table 3
Amendment No. 1 to Deep Community Wells Agreements
Overland Water Transport - Approved Projects and Costs by Province

	Number of Approved Projects	Federal Share of Costs to March 31, 1978
Manitoba	205	\$ 35 083
Saskatchewan	1 410	105 396
Alberta	813	161 401
Totals	2 428	\$301 880

Figure 3

PFRA Water Development Offices

10



Southwest Saskatchewan Irrigation Projects

Since 1935, PFRA has constructed 27 water storage projects and seven irrigation projects in southwest Saskatchewan. The Southwest Saskatchewan Irrigation Projects Division continues to operate and maintain 23 of the water storage projects. The other four reservoirs have been transferred to the province.

The Swift Current District Engineering Office provided engineering supervision for the operation and maintenance of the seven irrigation projects owned by Canada. During the year, surveys were performed for land levelling, border dyke layouts, ditch and drain locations, and the construction of numerous small structures.

Services provided by the Field Construction Section included: replacement of the irrigation outlet control gate on the Val Marie Dam, replacement of the irrigation outlet and spillway repairs on the Eastend Dam, reconstruction of 7 320 metres (24 000 feet) of the irrigation canal system on the Rush Lake Irrigation Project, and reconstruction of 11 540 metres (38 000 feet) of the irrigation canal system on the Maple Creek Project.

PFRA's storage projects provided water to farm operations for the irrigation of some 37 169 acres in 1977. Of the land irrigated, 23 220 acres are located on the seven federal irrigation projects, 8 653 acres are located on seven provincial irrigation projects and 5 296 acres are irrigated under private water licenses. The city of Swift Current and the towns of Gravelbourg and Lafleche rely on PFRA reservoirs for domestic and commercial supplies. (See Table 4.)

Under the Boundary Waters Treaty of 1909, some reservoirs are used to meet international commitments for the control of flows between Canada and the United States. All storages provide some recreational and wildlife benefits.

In 1977, the natural runoff of Lodge Creek, Battle Creek and Frenchman River was extremely low, being only 3 per cent, 17 per cent and 14 per cent

respectively of the average long-term runoff. The combined natural runoff of these tributaries was 19 900 cubic decametres (16 100 acre-feet), of which the United States received 12 500 cubic decametres (10 100 acre-feet). This quantity is 126 per cent of its allotment under the treaty. Although the flows delivered across the international boundary by both countries were deficient for a number of periods during the irrigation season, the deficits were soon refunded by subsequent deliveries, and each country received its allotted share for the irrigation season. The problems that developed due to the low runoff were resolved by close liaison and cooperation between the field representatives of both countries.

Extremely low natural runoff of all watersheds resulted in only one irrigation on the Maple Creek Project, and necessitated a release from Cypress to the Frenchman River to provide irrigation water to Eastend and Val Marie. The first release was from April 4 to May 13, 1977 and diverted a total of 13 200 cubic decametres (10 700 acre-feet); the second was from June 23 to August 6, 1977 and diverted 7 650 cubic decametres (6 200 acre-feet).

Farmers with irrigated land are generally dryland farmers and ranchers who utilize the irrigated land to produce forage crops for their livestock. The majority of lands held by farmers on PFRA projects are under agreement for sale.

Table 4
SOUTHWEST SASKATCHEWAN IRRIGATION PROJECTS
Summary of Users, 1977

Project	PFRA Projects					Private Water Rights		Provincial Projects		Urban		
	Total Developed Irrigated Acres	Land Tenure of Irrigated Area (Acres)				Number of Patrons	Developed Irrigated Acres	Number of Patrons	Name	Acres	Number of Patrons	Name
		Deeded	Agreement for Sale	PFRA Land Project Land	Community Pastures							
Consul	3 443	851	2 572	0	20	51	10	1	Vidora	2 595	57	
Eastend	2 919	438	2 481	0	0	40	128	2				
Maple Creek	2 658	274	2 384	0	0	62	87	2				
Maple Creek Flats												
"V" Project Area	1 264	68	823	0	373	21	0	0				
Swift Current	5 879	682	4 591	606	0	172	4 086	47	North Waldeck	1 648	22	City of Swift Current
Rush Lake									Herbert	720	8	
Val Marie	4 298	670	3 493	135	0	65	0	0				
West Val Marie	2 759	26	2 402	85	246	45	0	0				
Water Users not directly associated with operation of above projects							985	8	Lodge Creek	968	19	Town of Gravelbourg
									Middle Creek	414	10	Town of Lafleche
									Pambrun	999	3	
									Ponteix	1 309	22	
Total	23 220	3 009	18 746	826	639	456	5 296	60		8 653	141	3

Demonstration Farm

The Demonstration Farm at Outlook, Saskatchewan continues to play a significant role in the development of the South Saskatchewan River irrigation project. Members of all sectors of the agricultural industry rely on the farm for specialized information on irrigation, drainage, special crops, fertilizers, weed control and special equipment.

Livestock activities during 1976-77 included an intensive grazing trial combined with the preparation of cattle for finishing, and corn silage feeding tests. Many beef producers were sufficiently impressed with the corn silage test results to embark on the growing of silage corn.

Cash crops grown under irrigation continued to be of interest. Contract crops of confection sunflowers, dry field beans and canary seed grown during the year demonstrated the practicality of these crops as a means of agricultural production diversification.

Other projects which generated interest included: horticultural plots, demonstration fields of soft wheat, grain sorghum and triticale (a hybrid of wheat and rye).

Meteorological data, which provides valuable information for the scheduling of irrigation, continued to be collected and recorded at the farm by Atmospheric Environment Service.

Group tours were conducted for an estimated 600 special visitors, including provincial crop and farm management specialists, university professors, students, graduates and postgraduates, and delegates to a water resource conference.

The farm continued to function as a tourist attraction, providing visitors from all parts of the world an opportunity to observe irrigation farming in progress on the Canadian prairies.

Tree Nursery

Early in the fiscal year, 6.96 million seedlings were distributed by the PFRA Tree Nursery, an increase of almost one million over 1976. Part of the additional demand was attributed to the threat of drought. Since the nursery's inception in 1902, more than 400 million seedlings have been distributed to prairie farmers.

Eighty per cent of seedlings shipped during the year were used for shelterbelts, 18 per cent for provincial and municipal plantings, and 2 per cent for federal developments. There was an increase in the demand for tree material to be used in wildlife and reclamation plantings by federal and provincial agencies.

Manitoba received 33 per cent of seedlings distributed in 1977, Saskatchewan received 55 per cent, and Alberta received 12 per cent.

Applied research has now produced adequate weed control in 11 of the 25 species of trees and shrubs grown at the nursery. The Japanese elm was evaluated and is now being distributed to areas of Manitoba affected by Dutch elm disease. Pheromones (sex attractants) are now being used in place of chemical insecticides for control of many shelterbelt pests.

Because commercially produced tree nursery equipment is not available, nursery staff constructed a soil sterilant applicator, a shielded herbicide sprayer, a shrub seeder and a bin watering device.

Saskatchewan Regional Engineering aided the nursery on a number of projects including: surveys for drainage ditches, a new irrigation piping layout, the installation of a new fuelling station, and a proposal for paving a yard area.

Detailed planting plans were provided, on request, to 461 farmers, an increase of 11 per cent over 1976.

Celebration of the 75th anniversary of the nursery was marked by a field day on July 12. A specially designed bronze plaque mounted on a historic cairn was unveiled during the ceremonies. A colour brochure, stickers and lapel pins were produced, and the anniversary theme was featured in information displays at major exhibitions including Mexabition in Saskatoon and Agribition in Regina.

Provision of Construction, Equipment and Services Within PFRA

The Construction, Equipment and Services Division continued to provide construction, tradeshop, and equipment repair services to all sections of PFRA. In 1977-78, the division completed 2 647 work assignments valued at \$2 358 000. Technical and administrative activities related to the following were carried out: the coordination of approval for all herbicide programs, the production of equipment rental rates and unit price schedules, research on equipment availability, appraisal and evaluation of new and used equipment, the preparation of purchase specifications, work site investigation, and construction cost estimates.

The field construction section completed 152 construction and maintenance assignments valued at more than \$1 million. In addition to activities mentioned elsewhere in this report, major projects included the installation of a new spillway on the Welwyn Dam, and repairs to the walkway and stoplog handling systems on the control weirs of Round and Crooked lakes. These lakes are vital components of the Qu'Appelle River system.

The service depot at Moose Jaw carried out 2 500 work assignments valued at \$1 321 000. Workshop activities included repairs valued at \$519 000 on 1 000 items. Construction or modification of 137 equipment items was valued at \$236 000. In addition, the following were completed during the year: 123 plumbing, heating and electrical assignments valued at \$98 000; 180 preventive maintenance and field service assignments valued at \$71 000; and 1 054 trucking assignments (involving 293 000 miles of travel) valued at \$205 000.

ENGINEERING PROGRAMS

The PFRA Engineering Service investigates, plans, designs, and is responsible for construction and maintenance of various works pertaining to water development, irrigation and community infrastructure programs. It provides technical assistance to the various PFRA offices including those responsible for the operation and maintenance of projects in which the federal government retains an interest. The Engineering Service also assists several outside agencies, such as the International Joint Commission and the Prairie Provinces Water Board which are engaged in studies of major river basins of interprovincial or international scope.

Specialized engineering units supply extensive services in investigation, planning, hydrology, design, geology, air survey, geotechnical evaluation and construction.

The regional offices of the Engineering Service are located in Winnipeg, Regina and Calgary. (Figure 4 shows the geographic location of projects conducted by the Regional Engineering Divisions.)

A special project office is located at Cutbank, Saskatchewan, to operate and maintain the South Saskatchewan River Project. The project office at Lethbridge, which administers the Alberta Irrigation Rehabilitation Program, has been amalgamated with the Alberta regional office in Calgary. The Geotechnical Division is located at the University of Saskatchewan, Saskatoon. The headquarters of all other specialized divisions are in Regina.

PFRA's major irrigation, reclamation, water storage and municipal works projects are summarized in Appendix V.

Figure 4

Regional Office Projects 1977-78

ALBERTA

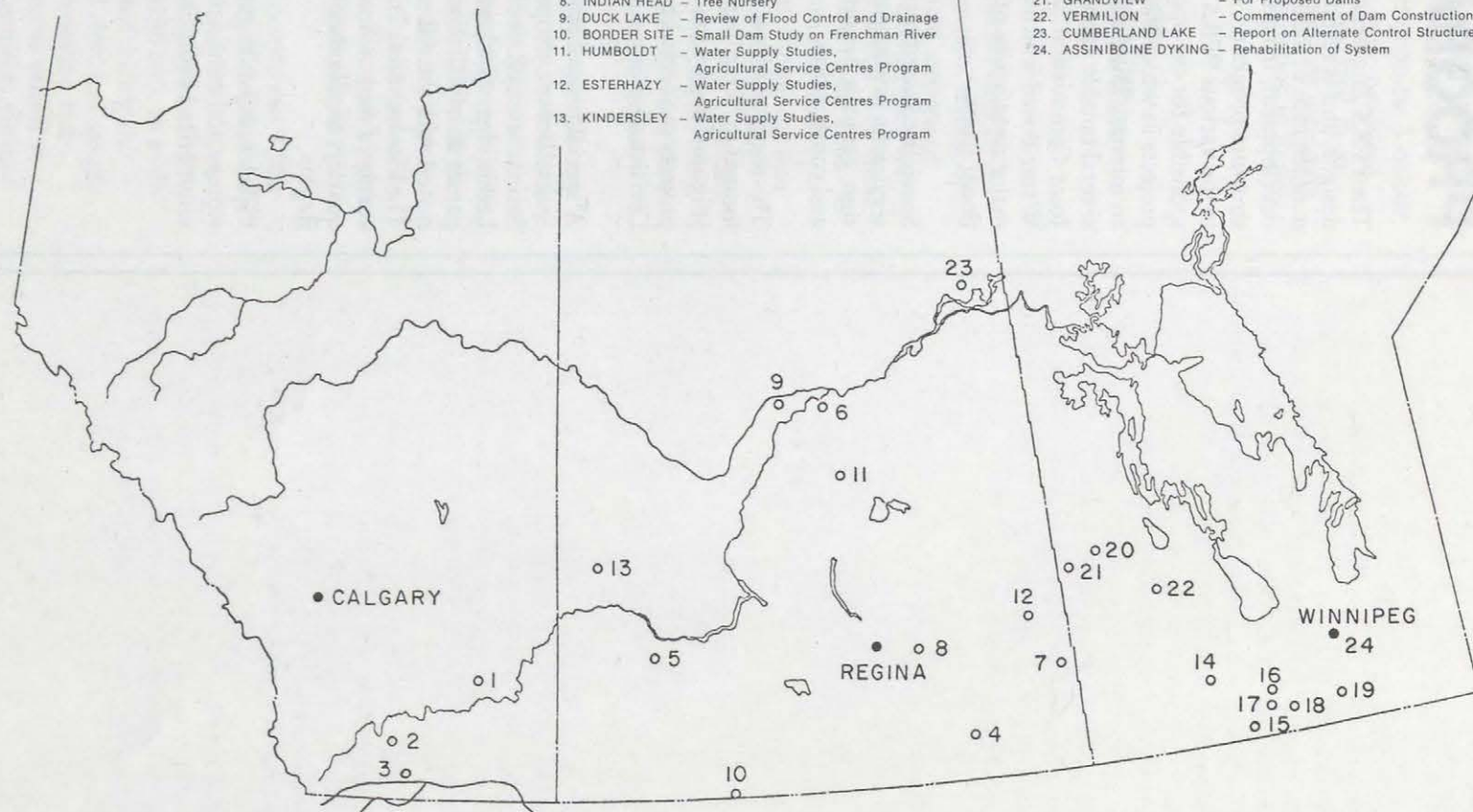
- 1. BROOKS - Replacement of Aqueduct
- 2. ST. MARY DAM - Repairs
- 3. MILK RIVER - Study of Potential Storage Reservoirs

SASKATCHEWAN

- 4. MIDALE - Water Supply Studies, Community Water Projects Program
- 5. CABRI - Water Supply Studies, Community Water Projects Program
- 6. BIRCH HILLS - Water Supply Studies, Community Water Projects Program
- 7. WELWYN - Repairs to Dam
- 8. INDIAN HEAD - Tree Nursery
- 9. DUCK LAKE - Review of Flood Control and Drainage
- 10. BORDER SITE - Small Dam Study on Frenchman River
- 11. HUMBOLDT - Water Supply Studies, Agricultural Service Centres Program
- 12. ESTERHAZY - Water Supply Studies, Agricultural Service Centres Program
- 13. KINDERSLEY - Water Supply Studies, Agricultural Service Centres Program

MANITOBA

- 14. McEACHERN - Dam Constructed
- 15. PLUM COULEE - Dugout and Rockfill Weir Constructed
- 16. ROLAND - Water Supply Studies
- 17. MYRTLE - Water Supply Studies
- 18. KANE - Water Supply Studies
- 19. LOWE FARM - Water Supply Studies
- 20. GILBERT PLAINS - Information Compiled
- 21. GRANDVIEW - For Proposed Dams
- 22. VERMILION - Commencement of Dam Construction
- 23. CUMBERLAND LAKE - Report on Alternate Control Structures
- 24. ASSINIBOINE DYKING - Rehabilitation of System



Agricultural Service Centres Agreements (ASCA) Program

This program, which provides financial and technical assistance for the construction of municipal water and sewer facilities in 54 designated communities in the prairie provinces, was introduced in Saskatchewan and Manitoba in 1972 and is to expire March 31, 1982. It was introduced in Alberta in 1973 and will expire March 31, 1979. (See Figure 5 for locations of centres.)

The total financial commitment authorized by the federal government is \$54 million. Half of this sum is provided as grants and half as loans to the provinces. Approximately \$32.6 million has been spent to date. (Figure 6 shows actual and forecast yearly program expenditures; actual and forecast expenditures by province are shown in Figure 7.)

Although most of the design work is performed by consulting engineering firms, PFRA makes substantial contributions in engineering and technical assistance, in administering all contracts, and in supervising construction.

The regional engineering offices are responsible for engineering investigation and preparation of reports on certain proposed works; planning, preparation, and processing of ASCA subsidiary agreements covering recommended construction; arranging for and administering engineering consultant service contracts; and administering and supervising supply and construction contracts at each centre.

In Manitoba, ASCA construction valued at \$5 million was completed during the year. Of this, \$3.6 million was funded under the program with the balance financed by the province or CMHC. Of the \$20 million in program funds allotted to Manitoba, \$12.2 million has been spent to date. During the year, work was carried out at nine of the 16 centres eligible under the program. Designs were completed for work at two other centres at which no contracts were awarded.

In Saskatchewan, \$3.5 million dollars was spent on ASCA construction, of which \$3 million was

funded under the program. By the end of the fiscal year, \$15.3 million of the total \$28 million allocated to the province had been spent. Supply and construction activities continued at 17 of the 26 designated centres. For three centres, water supply investigations were undertaken and preliminary engineering reports were prepared and submitted.

In Alberta, ASCA construction was valued at \$0.8 million of which \$0.7 million was funded under the program. By the end of the fiscal year, \$5.1 of the \$6-million allocation had been spent. Construction activities continued at five of the 13 designated centres in the province.

News releases were prepared and distributed on the signing of all ASCA subsidiary agreements and amendments, and on the awarding of all contracts valued at more than \$50 000.

Community Water Projects Program

In March 1973, the federal government made provisions for the financing and construction of community water storage projects in the prairie provinces. Such projects meet industrial, municipal, domestic, agricultural, recreational and other water needs in rural areas.

Projects are designed and constructed by PFRA, and construction costs are shared equally with the initiating province. On completion, the province accepts responsibility for ownership and operation.

Of the three eligible provinces, Manitoba has reacted with the most enthusiasm, and PFRA currently has agreements for the construction of five projects. The largest of these is the \$2.2-million Vermilion Dam which will create a reservoir on the Vermilion River to serve the town of Dauphin and the surrounding rural community. Construction, which began in 1977, is scheduled for completion in 1978. McEachern Dam, a \$118 400-rockfill weir with a maximum height of three metres (10 feet), was constructed on the Boyne River during the year. It will create a reservoir near the town of Carman. Two contracts valued at \$136 500 were awarded for the construction of

Figure 5

Designated Agricultural Service Centres

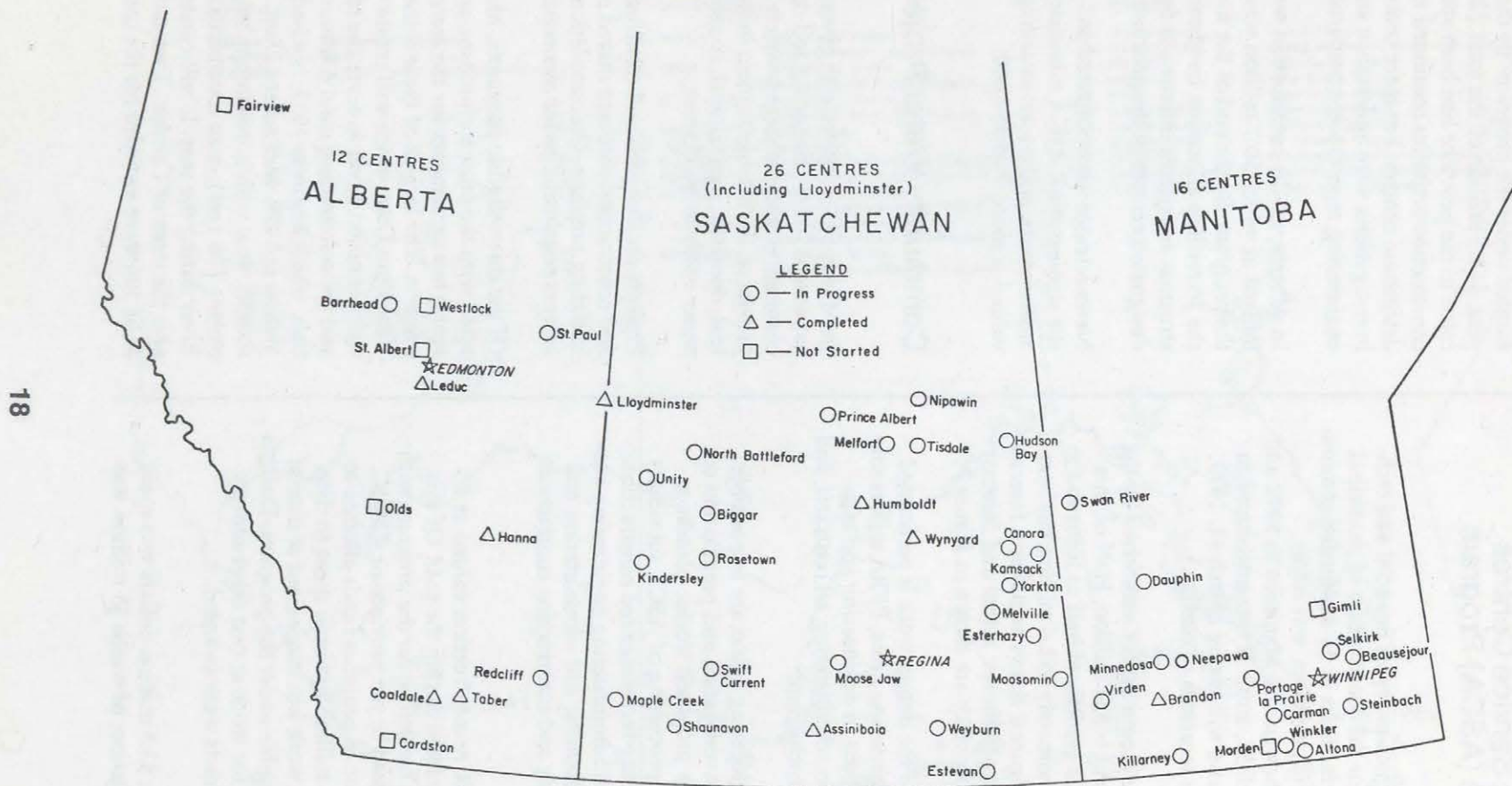


Figure 6

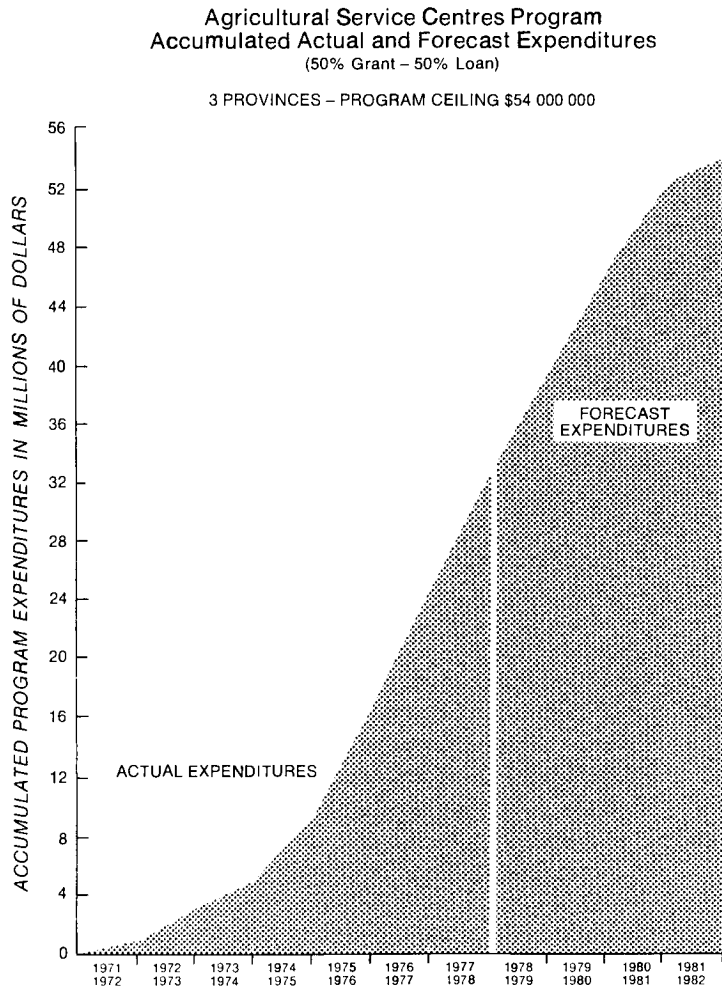
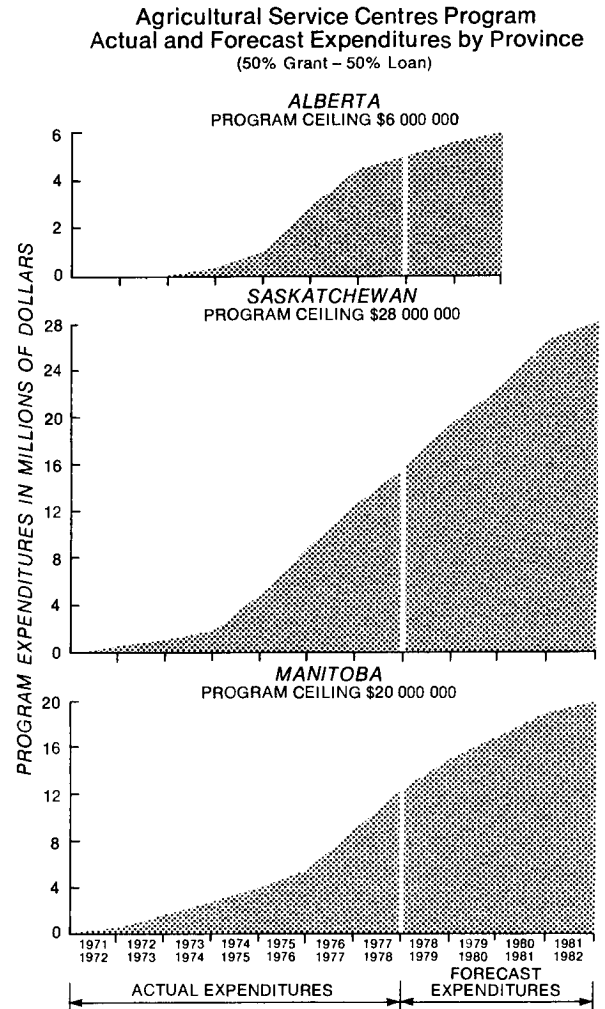


Figure 7



an off-stream water storage project to serve the village of Plum Coulee; the project is to be completed in 1978. A study for a water supply alternative for Roland, Myrtle and Lowe Farm was completed during the year, and additional information was obtained on the proposed Gilbert Plains and Grandview dams

In Saskatchewan, provincial officials have expressed interest in the program, and PFRA is now

cooperating in detailed studies of a number of potential projects. The most urgent of these are water intakes and pipelines for the towns of Midale and Cabri. A study on the water supply of the town of Birch Hills was started.

In Alberta, interest in the program has been expressed but no formal requests for related studies have been received.

Alberta Irrigation Rehabilitation

The Alberta Irrigation Rehabilitation Agreement of 1973 provided for the transfer to Alberta of Canada's interest in the St. Mary and Bow River irrigation projects. A federal financial commitment of \$36 million was made, of which about \$32 million was designated for the repair or replacement of irrigation works and structures. Included were four major installations on which an estimated \$26 million will be spent. These are: Carseland Dam, completed at a cost of \$4.2 million; Western Irrigation District Headworks, completed at a cost of \$3.6 million; Brooks Aqueduct, currently under construction and expected to cost \$8.1 million; and Bassano Dam, still in the design stage and estimated to cost \$10 million.

In 1977-78, Design Division completed final designs, contract drawings, and specifications for the canal structure on the Brooks Aqueduct replacement and began to prepare final designs for rehabilitation of the Bassano Dam.

Work at Brooks, under the direction of Alberta Regional Engineering, included construction of an earth embankment at a cost of \$5 million, the award of a \$1 450 000-contract for completion of a siphon under the C.P. railway, and numerous canal structures. Geotechnical Division provided quality control testing and monitoring of structure performance.

It is anticipated that main canal flows will be diverted through the new aqueduct in the 1979 irrigation season.

Repairs to the chute joints and underslab drainage of the St. Mary Dam spillway were undertaken by Alberta. PFRA provided the design and administered the construction at the request of the province. The contract, valued at \$338 000, was awarded in December 1976 and work was completed in June 1977.

South Saskatchewan River Project

Under the original agreement between Canada and the Province of Saskatchewan for the construction of the Gardiner and Qu'Appelle River dams forming Lake Diefenbaker, Canada is responsible for the maintenance of the works for a period of ten years, or until April 1, 1979. To perform this function, an operation and maintenance staff, a technical group of the Geotechnical Division, and an administrative support staff are maintained at the project. The operation and maintenance staff operates the equipment and maintains the structure, equipment and grounds. The Geotechnical Division is responsible for the installation, maintenance and monitoring of the test installations, and for interpreting and evaluating the information obtained.

The reservoir elevation was well below normal during the entire year, the maximum level being approximately 14 feet below full supply level. The main reservoir control was provided through the Saskatchewan Power Corporation's Coteau Creek generating station; minor amounts were released through the Qu'Appelle River Dam to maintain lake levels in the Qu'Appelle Valley, and through the irrigation pumping facility on the east side of the reservoir at the Gardiner Dam.

Dismantling of the townsite continued and all surplus equipment and houses were removed directly or were disposed of by the Department of Public Works.

Scheduled servicing and maintenance were carried out on equipment, structures and units associated with the Gardiner and Qu'Appelle River dams. Four gates on the spillway were sand-blasted and painted, and Tunnel #4 was dewatered for inspection. Normal instrumentation observations were carried out at both dams, and four slope holes, 12 piezometers, one deep bench mark and one surface movement line were installed during the year.

Studies and Investigations

A considerable number of surveys and investigations were undertaken by the Engineering Service during the fiscal year, usually at the request of various provincial agencies. Most were under the general supervision of the Regional Engineering Divisions, but involved the participation of other specialized divisions including Design, Geology and Air Surveys, Geotechnical, Hydrology, and Legal Surveys.

A special study, prompted by depleted water reserves in surface reservoirs and shallow aquifers, was requested in May 1977 by the Manitoba Department of Mines, Resources and Environment Management. PFRA was asked to investigate pumped diversions of water from several rivers in southern Manitoba. Investigations of nine diversion routes, involving discharges of up to 1.4 cubic metres (50 cubic feet) per second, and static heads of up to 122 metres (400 feet), were carried out. The work included hydrologic studies, route selections, optimization of pump and pipeline combinations, preliminary design of components, and calculation of cost estimates. A full report of the results was submitted in January 1978.

Negotiations have continued between the federal and Manitoba governments to transfer ownership and control of the dyke along the Assiniboine River between Portage la Prairie and Winnipeg. Additional field work and studies were carried out and a program for rehabilitation of the dyking system and its transfer to Manitoba was drafted.

At the request of the Department of Northern Saskatchewan in 1976, PFRA agreed to undertake a study of water levels in Cumberland Lake, and to design alternative control structures at the lake outlets. Manitoba Regional Engineering Division was made responsible for coordinating the studies. A major publication, *Report on Cumberland Lake Water Level Control Study, Appendix A - Hydrological Studies Report #88* was prepared by Hydrology Division. It describes the effects of controlling Rapid River and Big Stone Channel, the two outlets from the lake. The publication became

part of the complete report which was submitted to the Department of Northern Saskatchewan in September 1977.

A groundwater geology investigation and test-hole drilling conducted by Geology and Air Surveys Division, identified several extensive aquifers in an area that runs from northeast of Selkirk to the Winnipeg River. Water from these sources could be made available for future rural community and agricultural use.

Saskatchewan Regional Engineering Division began work on two specific studies during the year. One, initiated at the request of the Department of Indian Affairs and Northern Development, involved a review of a flood control and drainage scheme proposed for Duck Lake, which is midway between Saskatoon and Prince Albert. The second, requested by Environment Saskatchewan, concerned investigation and costing of smaller dam sites on the Frenchman River, which flows into Montana from southwest Saskatchewan.

Design Division made an extensive engineering study as a second phase of the investigation of the water supply in the Coronach area, close to the United States border south of Moose Jaw.

Hydrology Division published *A Report on the Effects of Routing Flood Flows through Reid Lake*, in February 1978. It reports on the effectiveness for flood control of the existing structures, and on the maximum flood levels that would be attained if floods were controlled to a flow of 85 cubic metres (3 000 cubic feet) a second - the overbank level of flow - at Swift Current, just northeast of the lake.

In October 1977, Alberta Environment requested PFRA to undertake studies of potential storage reservoirs on the Milk River and its major tributaries in southern Alberta. Alberta Regional Engineering Division accepted the assignment in the interest of enabling Canada to utilize more fully its share of this international waterway in keeping with long-term PFRA policy of water development and drought alleviation in chronically dry prairie areas. Geology and Air Surveys Division provided

engineering geology services and photogrammetric mapping for a preliminary study of potential dam sites, and Legal Surveys Division provided computations on control survey data for the area. Design, Geotechnical and Hydrology divisions were also involved in the study which determined seven possible dam sites. Coordination of the studies and evaluation of reservoir costs are to be completed by late July 1978.

Hydrology Division completed a major study of the median annual runoff in western Canada (Figure 8); a report will be published in the coming fiscal year. It is a computerized updating of a study done in the early 1960s and has been prepared to allow review every five years and updating every 10 years. More than 10 per cent of total man-hours in the division were spent delineating effective and gross drainage areas in the three prairie provinces. As a result, maps on a scale of 1:50 000 were produced for all existing and discontinuing hydrometric stations. The resultant lists of natural drainage areas are now accepted as official by provincial agencies and by the Inland Water Directorate of Environment Canada. Lists for immediate use have been distributed to provincial water resources agencies and to the Water Survey of Canada. A report on the completion of this study is being prepared for publication in 1978. *Report on 1977 Spring Runoff Monitoring Program*, published in August 1977 as part of the continuing program of measuring and evaluating runoff, shows the severity of drought at that time. No runoff was recorded at several of the 16 reservoirs monitored.

Other Activities

In addition to those features of engineering program activities most easily categorized, PFRA staff participated on numerous boards, committees and commissions. Work on the United States Burlington Dam Task Force required 91 man-days, and representation was established or continued on the Prairie Provinces Water Board Committees, the

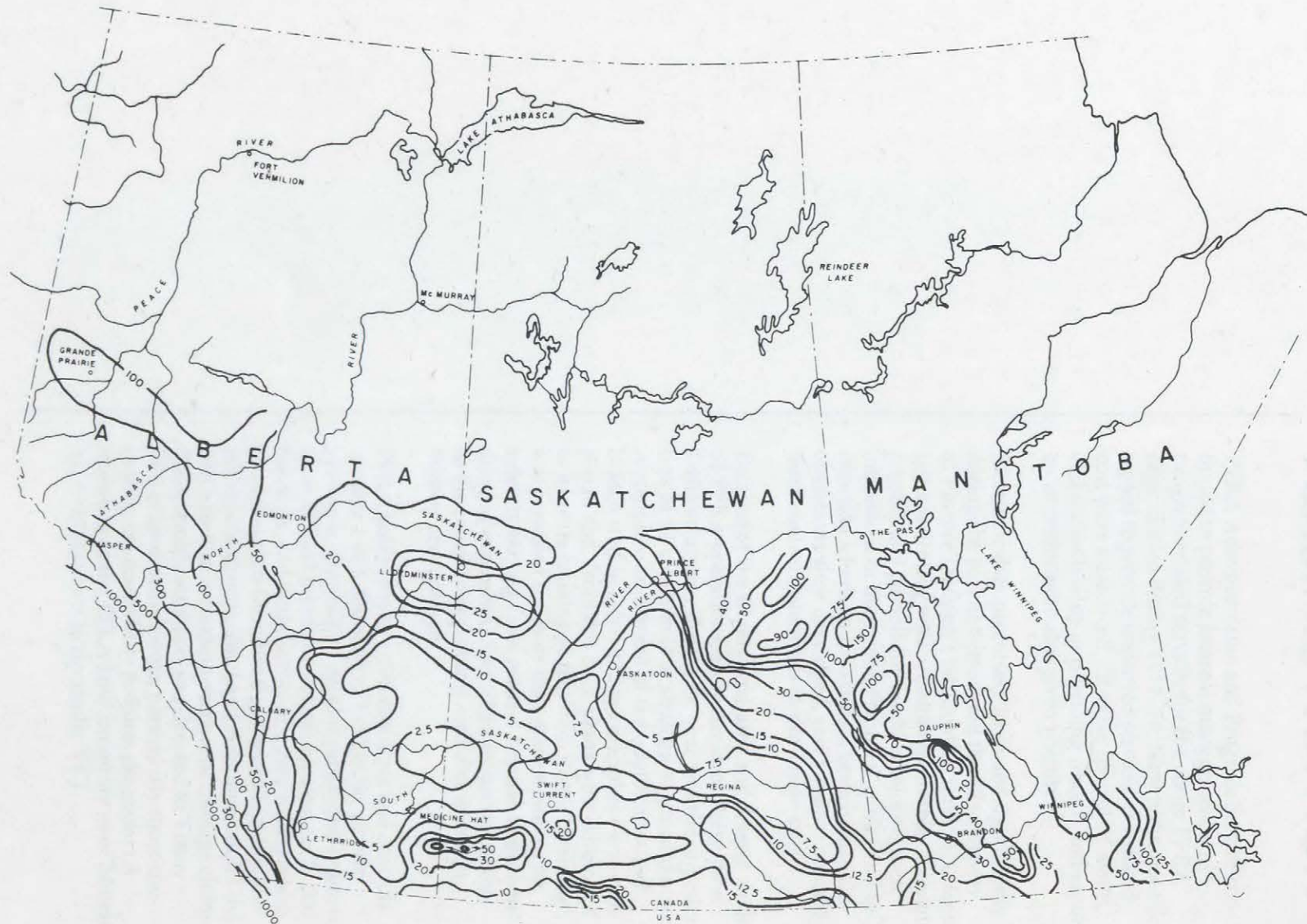
Battle Creek Steering Committee, the Souris River Basin Study Board, the international Souris-Red Rivers Engineering Board, the Poplar River Task Force and numerous other federal and international agencies.

About 20 per cent of the total work of Hydrology Division was accounted for by more than 100 studies, usually involving small communities. Design Division was engaged in 75 studies and construction projects, of which five were considered major and 43 involved ASCA work. The Drafting Section produced all working drawings, charts and illustrations for PFRA and for other federal agencies. Geotechnical Division drilled 8 843 metres of test holes and its laboratory conducted 26 356 tests on soil, aggregate, concrete and other building materials. As well, it prepared 308 plans for contract drawings and engineering reports, and conducted research on the application of nuclear density-moisture meters, air peizometers and hydraulic settlement gauges for monitoring use. Legal Surveys Division conducted surveys at 12 PFRA activity sites, including six large irrigation projects; these surveys required the drafting and processing of 29 plans for provincial registration. Preparation or approval of 354 descriptions required sketch plans and calculations for easements, sale agreements, assignments and letters patent.

Figure 8

Average Annual Runoff for the Prairie Provinces
(in cubic decametres per square kilometre)

23



ADMINISTRATION



ADMINISTRATION

PFRA Administration and Program Service continued to provide internal management and program-related services for the entire PFRA organization during 1977-78. New techniques designed to provide improved services at reduced cost were introduced. Effective control of assets, and accountability in providing records and reports on activities were also given priority.

Electronic data processing increased significantly during the year and improved the effectiveness of Finance Division's information services. Internal systems dealing with accounts receivable, accounts payable and payroll for casual employees were introduced or improved. Financial guides and instruction schedules to facilitate branch financial operations were developed, and a formal commitment control system was in the design stage.

Because of the widely separated and diverse nature of PFRA operations, a key Accident Prevention Division activity during the year was the organization of 13 committees at strategic regional centres. A complete assessment of the qualifications of branch staff in safety-related disciplines was completed and, from this data, plans were developed to increase training as required. Formal training was provided for more than 400 employees on subjects varying from general first aid to the handling of explosives. Special attention was given to the community pastures activities in which injuries are common.

PFRA holds title to 1 298 688 acres and controls another 1 083 869 acres of land in the prairie provinces. Disposal of surplus properties, improvement of land inventory records on close to 20 000 holdings, and introduction of a new management control system for oil and gas leases highlighted the year in review. The Land Administration Division noted an increasing number of damage claims. Considerable attention was devoted to Treaty Indian land entitlements, particularly those concerning the community pastures program. (A summary of the PFRA land inventory as of March 31, 1978 is shown in Appendix VI.)

Major activities of the General Services Section for the year included liaison with the Department of Public Works, which has been in charge of complete renovations of the Motherwell Building, PFRA headquarters in Regina. These renovations involved the movement of complete floors of staff and equipment out of, and back into the building. Data entry terminals and a mini-computer were installed to facilitate branch data processing, and headquarters records management facilities and services, including security arrangements, were substantially updated.

During the year, the Materiel Management Section concentrated on an improved computerized inventory control for materiel and equipment. Disposal of surplus or obsolete equipment and stores was increased, and improved guidelines for material management were developed. Value of procurement reached a record high of \$3.8 million during the year.

The Management Services Section gave special attention to problem-solving and developmental work related to expanded computer facilities at headquarters. These facilities serve both the technical and administrative facets of PFRA programs. Advisory services to management continued, in line with the branch objectives of increasing operational efficiency.

During the year, priority was placed on increasing the use of the Library Section as an information centre for all PFRA divisions. Use of computerized literature searches became a regular feature of library service, and interlibrary loans increased from 210 in 1976-77 to 643 in 1977-78. Shared library services, pioneered in the federal service by PFRA, continued to be very popular with participating departments.

PUBLIC INFORMATION

During the year, the Public Information Division was transferred from the Administration and Program Service and placed under the authority of the Deputy Director. This, with other procedural changes now in operation, is assisting staff in becoming more immediately responsive to management decisions and public relations needs.

News releases on all aspects of PFRA activities, from ministerial visits to ASCA contract awards and the completion of projects, totalled 73. In addition, seven 16mm films were produced for television broadcast, and a number of photographs with cutlines were distributed. Details of federal drought-relief measures received the greatest media coverage, and wide publicity was given to the 75th anniversary of the tree nursery. Events of local interest were covered extensively by community newspapers and the broadcast media.

Three new colour publications were produced, including a 16-page die-cut booklet for the tree nursery and small pamphlets on community pastures and water development; other publications were updated. Press kits with specific information on various aspects of PFRA programs were distributed at all special events.

The division's photographic laboratory responded to more than 1 000 requests for service from all segments of PFRA and from many other federal agencies. These requests resulted in the processing of 3 800 negatives and 9 000 prints, including oversized enlargements and the copying of line and continuous-tone originals.

Several slide-sound presentations were produced during the year. More than 100 000 negatives and 60 000 colour transparencies are now on file, providing material for news items, feature articles and audio-visual presentations.

In addition to the filling of requests for information, the division presented information displays at a number of exhibitions.



APPENDIX I

EXPENDITURES BY ACTIVITIES

Includes Operation, Maintenance, Capital Funds and Contributions
1935 - March 31, 1978

	1977-1978	1935-1978
ADMINISTRATION		
Regina, Administration	\$ 2 120 115	\$ 18 150 262
LAND USE SERVICE		
Cultural Work - Soil Drifting, etc. (Experimental Farm Service)	—	4 966 394
Community Pastures - Construction, Operation and Maintenance	8 179 880	90 955 983
Movement of Settlers	—	227 841
WATER DEVELOPMENT SERVICE		
Supervision, Individual Dugouts, Wells, Community Large Water Storage and Irrigation Projects	7 348 753	97 745 942
Equipment - Purchase and Repairs, Service Depot	2 161 316	27 455 106
Tree Nursery	1 271 288	11 006 523
Bow River Irrigation Project	—	47 353 798
ENGINEERING SERVICE		
Surveys, Design, Geotechnics, Drainage Studies, Legal Surveys, Supervision of Construction	5 757 585	68 389 182
St. Mary Irrigation Project	—	33 928 864
South Saskatchewan River Project	216 926	138 659 609
Assiniboine River Dyking	—	1 743 773
Shellmouth Dam and Portage Diversion	13 125	14 786 660
B.C. Reclamation and Development, including Lillooet Project	—	3 310 182
Land Protection and Reclamation, Manitoba and Eastern Canada	—	4 136 021
Alberta Irrigation Rehabilitation	3 995 981	22 472 423
Agricultural Service Centres	3 668 729	16 327 252
Vermilion Dam and Reservoir	479 194	519 425
Miscellaneous Projects - Construction	113 863	5 586 634
	<u>\$35 326 755</u>	<u>\$607 721 874</u>
REVENUES BY ACTIVITIES		
Community Pastures Operations	\$ 4 714 641	\$ 42 703 645
Irrigation Project Operation and General Revenue	1 411 019	25 476 881
	<u>\$ 6 125 660</u>	<u>\$ 68 180 526</u>

APPENDIX II
DEVELOPMENT AND OPERATION OF COMMUNITY PASTURES
1938-1978

<i>Fiscal Year</i>	<i>Operating Pastures</i>	<i>Acreage in Pastures</i>	<i>Construction Costs \$</i>	<i>Livestock Units Pastured</i>	<i>Acres Per Livestock Unit</i>	<i>Revenue \$</i>	<i>Operating Costs* \$</i>	<i>Stock Unit Operating Cost \$</i>	<i>Unit Cost to Patron \$</i>	<i>Municipal Levy Paid** \$</i>
1938-39	14	189 800	165 995	3 231	58.7	6 340	10 186	3.15	1.96	—
1948-49	54	1 436 480	277 358	71 393	20.1	204 012	175 666	2.46	2.86	—
1958-59	62	1 815 265	390 641	117 032	15.5	542 607	686 449	5.87	4.64	—
1968-69	88	2 382 456	696 754	172 629	13.8	1 570 652	1 554 688	9.01	9.10	170 000
1969-70	88	2 386 799	921 610	172 624	13.8	1 652 165	1 666 223	9.65	9.57	160 959
1970-71	90	2 431 784	1 004 514	182 689	13.3	1 754 194	1 900 158	10.40	9.60	162 974
1971-72	93	2 430 940	757 659	205 611	11.8	1 954 604	2 002 379	9.74	9.51	176 435
1972-73	94	2 431 420	650 889	216 708	11.2	1 912 347	2 368 818	10.93	8.82	182 373
1973-74	95	2 419 100	920 504	234 488	10.3	3 217 128	3 014 999	12.86	13.72	182 680
1974-75	95	2 409 220	3 311 642	242 176	9.9	3 116 880	3 549 388	14.66	12.87	188 854
1975-76	96	2 405 392	2 438 966	250 532	9.6	3 712 383	4 238 348	16.92	14.82	191 755
1976-77	96	2 240 447	2 259 723	241 135	9.3	3 584 175	4 337 671	17.99	14.86	200 662
1977-78	97	2 405 381	1 859 358	251 338	9.6	4 714 641	4 600 536	18.30	18.76	193 488
Totals	1938-78		25 668 481			42 703 645	43 589 690			

*Includes direct operating costs only. Does not include supervision, capital and overhead.

**1963-64 was the first year tax levied.

N.B. Detailed annual figures for years 1938 through 1968 are available in the 1975-76 PFRA Annual Report.

APPENDIX III
 SERVICES PROVIDED BY WATER DEVELOPMENT DIVISION
 1977-1978

Agency	Dugouts		Stockwatering Dams			Irrigation			Drainage			Community Projects				Wells	Other	Total					
	Technical Investigation	Final Inspection	Technical Investigation	Survey	Plan	Final Inspection	Technical Investigation	Survey	Plan	Final Inspection	Technical Investigation	Survey	Plan	Technical Investigation	Survey	Plan	Report	Final Inspection	Technical Investigation	Final Inspection			
PFRA Program	1 011	2 153	704	233	212	130	1 085	366	314	173	50	14	2	280	11	18	7	8	642	6 651	471	14 535	
Federal Request	3	—	1	5	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	22	33
Provincial Request	5	1	139	31	28	4	92	28	15	1	8	2	3	3	—	—	—	—	1	—	—	48	409
Municipal Rural-Urban	—	—	1	1	—	—	1	—	—	—	2	—	—	11	3	1	—	—	—	—	—	9	29
Other Groups or Individuals	—	—	—	—	—	—	1	—	—	—	7	—	—	2	—	—	—	—	—	—	—	11	21
TOTAL	1 019	2 154	845	270	241	134	1 179	394	329	174	67	16	5	296	15	19	7	8	643	6 651	561	15 027	

Capital expenditures on individual projects:

Dugouts	\$ 618 889
Stockwatering Dams	41 895
Irrigation	100 111
Wells	3 142 692
Total	\$3 903 587
Total capital expenditures on small community projects	65 139
Total all projects	\$3 968 726

APPENDIX IV
WATER DEVELOPMENT DIVISION

Number of Projects and Financial Assistance Paid from Inauguration of Program to March 31, 1978

<i>Province and Classification</i>	<i>Dugouts</i>		<i>Stockwatering Dams</i>		<i>Irrigation Schemes</i>		<i>Wells</i>		<i>Total</i>	
	<i>Number of Projects Paid</i>	<i>Assistance Paid \$</i>	<i>Number of Projects Paid</i>	<i>Assistance Paid \$</i>	<i>Number of Projects Paid</i>	<i>Assistance Paid \$</i>	<i>Number of Projects Paid</i>	<i>Assistance Paid \$</i>	<i>Number of Projects Paid</i>	<i>Assistance Paid \$</i>
MANITOBA										
Individual	19 776	3 057 548	364	36 681	380	165 996	6 423	1 891 247	26 943	5 151 473
Neighbour	77	21 852	18	6 445	24	15 408	—	—	119	43 705
Small Community	44	135 585	25	134 402	2	30 583	—	—	71	300 569
TOTAL	19 897	3 214 985	407	177 528	406	211 987	6 423	1 891 247	27 133	5 495 747
SASKATCHEWAN										
Individual	57 567	9 659 056	6 276	778 445	3 778	1 162 079	9 342	3 518 611	76 963	15 118 191
Neighbour	433	137 580	65	15 041	208	129 357	—	—	706	281 978
Small Community	599	1 207 610	225	1 169 530	74	697 439	—	—	898	3 074 579
TOTAL	58 599	11 004 246	6 566	1 963 016	4 060	1 988 875	9 342	3 518 611	78 567	18 474 748
ALBERTA										
Individual	21 557	4 380 966	4 474	691 630	1 844	601 188	12 127	4 712 292	40 002	10 386 077
Neighbour	68	26 956	18	7 108	34	20 110	—	—	120	54 173
Small Community	233	643 042	131	839 371	68	752 421	—	—	432	2 234 834
TOTAL	21 858	5 050 964	4 623	1 538 109	1 946	1 373 719	12 127	4 712 292	40 554	12 675 084
GRAND TOTAL	100 354	19 270 195	11 596	3 678 653	6 412	3 574 581	27 892	10 122 150	146 254	36 645 579

APPENDIX V
 MAJOR PROJECTS - IRRIGATION, RECLAMATION, WATER STORAGE AND MUNICIPAL WORKS¹
 1935 to March 31, 1978

<i>Name of Project</i>	<i>Location</i>	<i>Type of Project</i>	<i>Date Completed</i>	<i>Irrigated Acres</i>	<i>Storage Capacity Acre-Feet</i>	<i>Costs² \$</i>
MANITOBA						
Assiniboine River Dyking and Cut-offs	Brandon and Portage la Prairie to Baie St. Paul	Flood Control	Not Yet Complete	—	—	1 743 773
Northwest Escarpment Reclamation Project — Riding Mt. Area	Dauphin Area	Flood Control	1966	—	—	1 313 103
Fairford River Project	Lake Manitoba	Flood Control	1960	—	—	287 751
Saskatchewan River Reclamation — Pasquia Area	The Pas	Reclamation	1960	—	—	2 256 388
Shellmouth Dam and Portage Diversion	Shellmouth and Portage la Prairie	River Control	1970	—	390 000	14 786 660 ³
Agricultural Service Centres	16 Communities	Water and Sewer	Not Yet Complete	—	—	6 069 577 ⁴
The Pas Indian Reserve	The Pas	Water, Sewer and Roads	1975	—	—	1 099 744
Vermilion Dam and Reservoir	Dauphin	Water Supply	Not Yet Complete	—	—	519 425 ³
SASKATCHEWAN						
South Saskatchewan River Project	Outlook	Multi-Purpose	1969	350 000 (potential)	7 600 000	120 134 936 ⁵
Buffalo Pound Project	Qu'Appelle Valley	Water Supply	1960	—	42 000	2 293 145
Eyebrow Lake Diversion	Eyebrow	Water Supply	1960	—	—	98 376
Agricultural Service Centres	26 Communities	Water and Sewer	Not Yet Complete	—	—	7 631 988 ⁴

<i>Name of Project</i>	<i>Location</i>	<i>Type of Project</i>	<i>Date Completed</i>	<i>Irrigated Acres</i>	<i>Storage Capacity Acre-Feet</i>	<i>Costs² \$</i>
ALBERTA						
Bow River	Vauxhall	Irrigation	—	235 000	408 862	—
(a) Purchase of Canada Land & Irrigation Company	—	—	—	—	—	2 353 517
(b) Development and Construction	—	—	1974	—	—	24 941 316
St. Mary	Lethbridge	Irrigation	—	300 000	460 000	25 160 993
Sawridge Creek	Slave Lake	Flood Control	1973	—	—	248 377
Alberta Irrigation Rehabilitation	3 Projects	Irrigation	Not Yet Complete	—	—	22 451 120 ⁶
Agricultural Service Centres	13 Communities	Water	Not Yet Complete	—	—	2 537 635 ⁴
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation	1951	629	2 000	185 491
Chase & Johnston — Western Canada Ranching	Kamloops	Irrigation	1951	755	—	98 243
Lillooet — Pemberton	Pemberton	River Control	1953	—	—	1 056 539
Westbank Project	Kelowna	Irrigation	1950	1 200	2 500	537 450
Penticton West Bench	Penticton	Irrigation	1953	800	—	66 362
B.C. Fruitlands	Kamloops	Irrigation	1966	2 000	—	200 000

¹ Funds for certain of these projects were provided by special votes of Parliament.

² Figures do not include operation and maintenance expenditures.

³ Canada's share only.

⁴ Grants only — does not include loans of equal amounts.

⁵ Includes \$25 000 000 contributed by Province of Saskatchewan.

⁶ Includes grants to Province of Alberta of \$3 500 000 for secondary works and \$6 200 000 associated with the turnover of Canada's interest in the Bow and St. Mary Rivers.

APPENDIX VI
SUMMARY OF LAND INVENTORY TO MARCH 31, 1978

	<i>Title (Acres)</i>	<i>Reservation, Order-in-Council Lease, Easement (Acres)</i>	<i>Total (Acres)</i>
I. WATER DEVELOPMENT SERVICE			
A. <i>Water Conservation</i>			
Manitoba	1.3	—	1.3
Saskatchewan	10 126.2	837.8	10 964.0
Alberta	107.6	563.4	671.0
B. <i>Southwest Saskatchewan Irrigation Projects</i>	46 145.9	434.9	46 580.8
C. <i>Tree Nursery</i>	160.0	480.0	640.0
D. <i>Demonstration Farm</i>	169.6	—	169.6
	<u>56 710.6</u>	<u>2 316.1</u>	<u>59 026.7</u>
II. LAND USE SERVICE			
A. <i>Community Pastures</i>			
Manitoba	4 744.4	408 811.8	413 556.2
Saskatchewan	1 235 354.0	569 465.7	1 804 819.7
Alberta	—	103 220.0	103 220.0
	<u>1 240 098.4</u>	<u>1 081 497.5</u>	<u>2 321 595.9</u>
III. ENGINEERING SERVICE			
A. <i>Assiniboine River Dyking</i>	1 121.6	55.2	1 176.8
IV. MISCELLANEOUS			
A. <i>Hydrometric Sites</i>	10.0	—	10.0
B. <i>Service Depots</i>	24.5	0.5	25.0
C. <i>Bow River Exchange Lands</i>	723.0	—	723.0
	<u>757.5</u>	<u>0.5</u>	<u>758.0</u>
SUMMARY			
I. Water Development Service	56 710.6	2 316.1	59 026.7
II. Land Use Service	1 240 098.4	1 081 497.5	2 321 595.9
III. Engineering Service	1 121.6	55.2	1 176.8
IV. Miscellaneous	757.5	0.5	758.0
	<u>1 298 688.1</u>	<u>1 083 869.3</u>	<u>2 382 557.4</u>

1

1